

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

FUNKE *et al.*

Appl. No.: 10/581,348

§ 371(c) Date: April 6, 2007

For: Active Compound Combinations  
Having Insecticidal Properties

Confirmation No.: 4992

Art Unit: 1616

Examiner: Pak, John D.

Atty. Docket: 2400.0430000/RWE

**Declaration of Elke Hellwege Under 37 C.F.R. § 1.132**

*Mail Stop Amendment*

Commissioner for Patents  
PO Box 1450  
Alexandria, VA 22313-1450

I, Elke Hellwege, of Louvecciennessstr. 91, 40764 Langenfeld, Germany, a citizen of  
Langenfeld, Germany, hereby declare:

1. That I am a biologist having studied at the University of Würzburg,  
Germany.
2. That I received my diploma degree in biology at the University of Würzburg,  
Germany in 1990.
3. That I received my Ph.D. in biology at the University of Würzburg, Germany  
in 1995.
4. That I worked as a Postdoc at the University of Würzburg, Germany in 1995.
5. That I worked as a Postdoc at the Institut für Genbiologische Forschung in  
Berlin, Germany from 1995 until 1996.
6. That I worked as a Postdoc at the Max-Planck Institute for Molecular Plant  
Physiology in Golm, Germany from 1997 until 2000.

7. That I entered the employ of PlantTec/Aventis Crop Science in 2000.
8. That I entered the employ of Bayer CropScience AG, the assignee of the above-captioned application, since the acquisition of Aventis CropScience in 2002.
9. That I have specialized in plant physiology and plant biotechnology.
10. That the following tests have been carried out under my supervision and direction:

*Formula for the efficacy of the combination of two compounds*

11. The expected efficacy of a given combination of two compounds is calculated as follows (see Colby, S.R., "Calculating Synergistic and antagonistic Responses of Herbicide Combinations," Weeds 15, pp. 20-22, 1967):

If

X is the efficacy expressed in % mortality of the untreated control for test compound A at a concentration of m ppm respectively m g/ha,

Y is the efficacy expressed in % mortality of the untreated control for test compound B at a concentration of n ppm respectively n g/ha,

E is the efficacy expressed in % mortality of the untreated control using the mixture of A and B at m and n ppm respectively m and n g /ha,

$$\text{then is } E = X + Y - \frac{X \times Y}{100}$$

12. If the observed insecticidal efficacy of the combination is higher than the one calculated as "E," then the combination of the two compounds is more than additive, i.e., there is a synergistic effect.

### Example A

#### 13. *Phaedon cochleariae* – test; spray application

Solvent: 7 parts by weight of dimethylformamide

Emulsifier: 2 parts by weight of alkylaryl polyglycoether

To produce a suitable preparation of active compound, 1 part by weight of active compound is mixed with the stated amount of solvent and emulsifier, and the concentrate is diluted with emulsifier-containing water to the desired concentration. Ammonium salt and/or penetration enhancer in a dosage of 1000 ppm are added to the desired concentration if necessary. Cabbage leaves (*Brassica oleracea*) are treated by being sprayed with the preparation of the active compound of the desired concentration and are infested with mustard beetle larvae (*Phaedon cochleariae*). After the specified period of time, mortality in % is determined. 100 % means that all the beetle larvae have been killed; 0 % means that none of the beetle larvae have been killed. The mortality values determined thus are recalculated using the Colby-formula (see paragraph 11). According to the present application in this test e.g. the following combinations show a synergistic effect in comparison to the single compounds:

Table A: *Phaedon cochleariae* – test

<u>Active Ingredient</u>	<u>Concentration</u> <u>in ppm</u>	<u>Efficacy</u> <u>in % after 3<sup>d</sup></u>
I-I-4	2	10
	0.08	0
Fipronil	0.4	25
I-I-4 + Fipronil (5 : 1) according to the invention	2 + 0.4	obs.*    cal.** 95      32.5
I-I-4 + Fipronil (1 : 5) according to the invention	0.08 + 0.4	obs.*    cal.** 95      25

\*obs. = observed insecticidal efficacy, \*\* cal. = efficacy calculated with Colby-formula

### Example B

#### 14. *Plutella xylostella* – test; spray application

Solvent: 7 parts by weight of dimethylformamide

Emulsifier: 2 parts by weight of alkylaryl polyglycoether

To produce a suitable preparation of active compound, 1 part by weight of active compound is mixed with the stated amount of solvent and emulsifier, and the concentrate is diluted with emulsifier-containing water to the desired concentration. Ammonium salt and/or penetration enhancer in a dosage of 1000 ppm are added to the desired concentration if necessary. Cabbage leaves (*Brassica oleracea*) are treated by being sprayed with the preparation of the active compound of the desired concentration and are infested with larvae of the diamondback moth (*Plutella xylostella*, sensible strain). After the specified period of time, the mortality in % is determined. 100 % means that all the caterpillars have been killed; 0 % means that none of the caterpillars have been killed. The mortality values determined thus are recalculated using the Colby-formula (see paragraph 11). According to the present application in this test e.g. the following combinations show a synergistic effect in comparison to the single compounds:

Table B: *Plutella xylostella* – test

<u>Active Ingredient</u>	<u>Concentration</u> <u>in ppm</u>	<u>Efficacy</u> <u>in % after 3<sup>d</sup></u>
I-1-4	0.08	45
	0.016	15
Ethiprole	0.4	0
I-1-4 + Ethiprole (1 : 5) according to the invention	0.08 + 0.4	obs.* 85    cal.** 45
Fipronil	0.08	15
I-1-4 + Fipronil (1 : 5) according to the invention	0.016 + 0.08	obs.* 60    cal.** 27.75

\* obs. = observed insecticidal efficacy, \*\* cal. = efficacy calculated with Colby-formula

### Example C

#### 15. *Myzus persicae* – test; spray application

Solvent: 7 parts by weight of dimethylformamide

Emulsifier: 2 part by weight of alkylaryl polyglycoether

To produce a suitable preparation of active compound, 1 part by weight of active compound is mixed with the stated amount of solvent and emulsifier, and the concentrate is diluted with emulsifier-containing water to the desired concentration. Ammonium salt and/or penetration enhancer in a dosage of 1000 ppm are added to the desired concentration if necessary. Cabbage leaves (*Brassica oleracea*) which are heavily infested by the green peach aphid (*Myzus persicae*) are treated by being sprayed with the preparation of the active compound of the desired concentration. After the specified period of time, mortality in % is determined. 100 % means that all the aphids have been killed; 0 % means that none of the aphids have been killed. The mortality values determined thus are recalculated using the Colby-formula (see paragraph 11). According to the present application in this test e.g. the following combinations show a synergistic effect in comparison to the single compounds:

Table C: *Myzus persicae* – test

<u>Active Ingredient</u>	<u>Concentration</u> <u>in ppm</u>	<u>Efficacy</u> <u>in % after 3<sup>d</sup></u>
I-1-4	10	5
	2	0
Ethiprole	2	0
I-1-4 + Ethiprole (5 : 1) according to the invention	10 + 2	<u>obs.*</u> <u>cal.**</u> 30        5
Fipronil	10	0
I-1-4 + Fipronil (1 : 5) according to the invention	2 + 10	<u>obs.*</u> <u>cal.**</u> 40        0

\* obs. = observed insecticidal efficacy,\*\* cal. = efficacy calculated with Colby-formula

16. The undersigned hereby declares further that all statements made herein of her own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2012-02-15

Date

Elke Heljvege  
Dr. Elke Heljvege